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# ADAPTING TO ANTICIPATED IMPACTS OF CLIMATE CHANGE IN THE CITY OF ROVANIEMI

## Summary



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**ILMASTONMUUTOKSEN ENNAKOITUIHIN VAIKUTUKSIIN  
SOPEUTUMINEN ROVANIEMELLÄ**

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## SUMMARY

Climate change and stricter obligations for the control of greenhouse gas emissions are issues that will directly and indirectly affect the functions of society and everyday life of its citizens. Global climatic change affects every population group, geographic region and level of administration, in other words, it affects everyone. The controlling of climate change and adapting to its anticipated impacts are not merely matters of co-operation between nations and national strategies, but also practical local government policies to be undertaken on the grass roots level.

Active reaction to climate change can be seen in Finland's municipal sector, which is evident in the involvement of municipalities in campaigns aiming at controlling climate change and saving energy. Although the participation of the municipal sector in the mitigation of greenhouse emissions has been mainly voluntary, it appears likely that in the future the obligations issued by the EU and national governments will also increasingly outline the climate tasks to be conducted by local government. Indications of this are evident, for instance with the Council of State's new long-term climate and energy strategy that requires provincial federations and urban districts to compile their own climate and energy strategies.

In addition to curbing climatic change, adaptation to climate change has received increased attention within the municipal sector. Indeed there are good grounds for municipalities to prepare for the threats and opportunities of climate change, as the impacts of climate change are ultimately concretised on the local level. The need for adaptation in general – no matter what regional level is in question – can be justified on the grounds of rather apparent reliable forecasts, according to which the climate will warm in the coming decades, regardless of whether greenhouse gases are reduced or not. Even though it may be interpreted as such, the point of departure for adaptation is not giving in to climate change, rather recognition of the facts. The climate will change and advance preparation for various consequences of such change is sensible.

By definition, adaptation to climate change usually means people and nature adapting to climatic changes that have already occurred or are anticipated, by either mitigating harms caused by the changes or utilising the possibilities provided by the changed climate. In this study, adaptation has been understood in a somewhat broader sense. It has been recognised

that in addition to local operators having to adapt to climate change, they would also need to adapt to stricter obligations to control greenhouse gases. One example of the latter is energy production, the operating environment of which is altered more by emissions trading and the need for more renewable energy than the direct impacts of climate warming on energy production potential. In other words, the obligations for the control of greenhouse gas emissions in energy production, as with certain other fields, may cause greater local needs for adaptation than the direct impacts of climate change.

The study conducted within this international Clim-ATIC project examines the adaptation to climate change in the city of Rovaniemi. As an area of focus, the city of Rovaniemi is in many ways a special case from the perspective of adapting to climate change. Tourism to Rovaniemi is very much focused on the Christmas season, which is suffering due to the uncertainty of snow cover as a consequence of climate change. The location of the city of Rovaniemi at the confluence of the Ounasjoki and Kemijoki rivers makes the town vulnerable to damage from likely flooding as climate change progresses. One of the special characteristics of Rovaniemi is also the town plan designed by the renowned architect Alvar Aalto that specifies the relatively low construction height of buildings. Combining this with the compacting of the town structure to curb climate change has caused some friction as to whether the building of tall buildings fits in with the Rovaniemi townscape. Another influencing factor for discussions on the urban structure of Rovaniemi is the tension created between the town centre and development of villages from the merging of the town and rural municipality in the recent municipal consolidation. When generalised more broadly, Rovaniemi with its special characteristics is a good indication that preparation for climate change not only requires national and regional strategies, but also municipal adaptation programmes tailored for local conditions.

As far as concerns the town of Rovaniemi, adapting to climate change was examined by concentrating on three themes significant for Rovaniemi and exposed to climate change. The themes are 1) tourism, 2) energy sector and waste management, and 3) urban planning and traffic. Material for the study used theme related expert panels, reviews of theme related literature, questionnaires aimed at municipal election candidates, as well as individual and group interviews of the representatives of village and housing associations. The goal for the selection of material was to collate diverse information by relying on the experts for the various themes and most recent research findings, and by taking into consideration the views of local inhabitants on climate change.

On the basis of information collected on tourism in Rovaniemi, climate change mostly affects Christmas travel which is based around Santa Claus, snowscapes and snow related activities. With the chances of a white Christmas becoming less likely, the significance of snow as an attraction

will probably be reduced in the future, which will require the development of experience products to replace the existing and partly the redirection of marketing measures. A temporary measure that could be used in the future to compensate for the lack of snow is to use artificially made snow, nevertheless in the long term it will not be possible or feasible to build Christmastime tourism around artificial snow.

According to climate models, Rovaniemi will retain its snow reliability during the winter period following Christmas, which strengthens Rovaniemi's competitive position in relation to the winter holiday destinations of South Finland and Central Europe, which will suffer even more from a lack of snow in the winter. Climate change for summertime tourism also appears to be more of an opportunity than a threat. The season is extended and in terms of other aspects, the conditions appear to be improving. However, significant input is needed in product development for promoting summertime tourism, for instance within the field of wellbeing and nature tourism that naturally suits Rovaniemi.

When speaking about the opportunities and threats posed on different tourism seasons by climate change, it is also worth giving consideration to how climate change is estimated to affect people's general travelling behaviour. The incorporation of air traffic within the scope of emissions trading and the growing climate awareness of passengers may reduce the popularity of long distance and air travel, thereby increasing the demands for rail travel and local trips. The predicting of such factors of change is nevertheless still just as difficult as predicting the trend in the price of crude oil, so the connections with the future development of Rovaniemi tourism remain, for the time being, pure speculation.

On the energy sector, the increase in precipitation related to climate change is estimated to increase potential for hydropower production in the Rovaniemi district, but in turn it poses challenges for the dam safety of power plants. In addition to hydropower, increased precipitation affects peat production by weakening certainty of delivery, which on the other hand balances out the temperature rise that improve peat drying and the extended production season. Due to predictions that storms and other extreme weather conditions will become more common, problems related to the reliability of the supply are also forecasted for electricity distribution.

In addition to these direct climate impacts, the energy sector in Rovaniemi has to adapt to obligations stipulated by the EU and state authorities concerning restrictions on greenhouse gas emissions, energy saving and the increase in the use of renewable energy. In Rovaniemi, the increase in the amount of renewable energy produced provides a significant opportunity for the planned Mustikkamaa power plant. Producing district heating and electricity, when completed the Mustikkamaa Power Plant is of a significant size and would be fuelled with logging waste, tree stumps

and woodchips made from small trees from young forests. In addition to climate perspectives, justifications for the power plant may be regarded as the need for an increase in district heating capacity, maintenance and supply factors, and the significant employment impacts of ensuring fuel supply for the power plant. Judging by the findings of interviews and questionnaires, there are mainly positive attitudes towards the plans for the Mustikkamaa Power Plant. Nevertheless, more accurate information on the economic feasibility of the plant, the sufficiency of wood fuels and the arrangement of the collection of these fuels in practice needs to be obtained for the basis of the power plant construction decision.

As a result of more efficient recycling and recovery of landfill gases, the methane emissions from waste management have been significantly reduced since the early 1990s. Although emissions have decreased, the amount of municipal waste placed in landfills still needs to be reduced in order to attain the goals set by the EU and Finland's waste policies, and this will also affect waste management in Rovaniemi. One alternative for reducing the amount of waste to be placed in landfills is the utilisation of waste unfit for recycling for producing energy at the planned Mustikkamaa Power Plant. In general, further investigation into the possibilities for burning waste is regarded as an important issue in Rovaniemi, and the initiation of investigations also needs to be interpreted in line with new national waste and climate policies.

As climate change progresses, the risks of autumn and winter floods, and in North Finland also the risk of springtime floods are predicted to increase, which is an issue that needs to be taken into consideration in the regional urban planning for Rovaniemi. Despite the increasing risk of floods, the appreciation of the water landscapes makes increases pressure to construct houses and holiday homes to shore areas that lie on ground that is too low. The town council, however, should not favour such plans, as construction should be directed to areas that do not hold the risk of flooding. Preventing the construction of new housing to flood risk areas is the most traditional, cheapest and on the basis of questionnaire findings also the most favoured means of minimising the risk of flooding. In addition to considering the flooding of waterways, urban planning should also take into account the more common occurrence of the flooding of urban areas caused by heavy rainfall, for which preparations may be made by planning and constructing greenbelt areas as urban flooding buffers.

One of the most important policies of urban planning nowadays is the integration of the community structure, which is not only justifiable due to economic factors, but also for curbing climate change. The aim of this integration is to direct construction to within the existing urban structures or within the immediate vicinity of such. This would mean that commuting trips would become shorter and the possibilities for utilising more eco-friendly means of travel, such as public transport, walking and

cycling would improve. However, on the basis of the findings of interviews and questionnaires, opinions appear to be divided as far as concerns the increase in construction efficiency in the town centre of Rovaniemi. Those in favour of increasing the construction efficiency feel that, for instance the reduction in private motoring, the need for apartment block homes, and the improvement of the cost effectiveness of municipal engineering speak for the compacting of the town centre. Those against the compacting of the town centre expressed concerns about the green zones, buildings of cultural historical importance, and the crowded nature of the town centre. The attitudes towards tall buildings were also divided. Some feel that tall buildings would make Rovaniemi look like a town, when others feel that taller buildings would spoil the Rovaniemi townscape. In order to achieve some kind of consensus, there would be a need for broadly-based public discussion on the optimal level for construction efficiency for the town centre.

For those living outside the town centre, the integration of community structure can easily appear to be the prioritisation of the town centre. The weakening of the service structure of Rovaniemi's rural villages has led to the village inhabitants increasingly being forced to seek the basic services they require from the municipal centres, often located rather distant from home. The target persons of the report regard one means of reducing the need for cars in sparsely populated areas and the use of private motoring as the development of the public transport system. This could mean that in addition to bus services, other forms of public transport such as pre-ordered taxis and subsidised transport pools would be used. Alongside the development of public transport, another alternative was the improvement of the mobility of services, for instance by using health care buses or multiple service vehicles.

Adaptation to climate change poses challenges and opens up possibilities for Rovaniemi's future development. This report analyses these challenges and opportunities by sector and undertakes to generally enhance the perspective of adaptation to climate change in the decision making of the Rovaniemi Town Council. In practice, the report information may be adapted, for instance when updating strategies for tourism or land use, or when making policies related to energy and waste management. In other respects, climate change and adapting to such are themes that, despite the economic downturn and cutbacks in the municipal economy, will become more significant in almost every sector of society.